

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: MITTELSTADT, WILLIAM A.  
Application No.: 09/888943 Confirmation No.: 9282  
Filed: June 25, 2001 Group Art Unit 3772  
Title: RESPIRATOR VALVE

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**BRIEF ON APPEAL**

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P.O. Box 1450  
Alexandria, VA 22313-1450

**CERTIFICATE OF TRANSMISSION [37 CFR § 1.8(a)]**

I hereby certify that this correspondence is being transmitted to United States Patent and Trademark Office on the date shown below via the Office electronic filing system.

March 5, 2010  
Date

/Susan M. Dacko/  
Signed by: Susan M. Dacko

Dear Sir:

This is an appeal from the Office Action mailed on October 15, 2009, in light of the Advisory Action mailed January 27, 2010, finally rejecting claims 27-47 and 49-71.

Fees

- ☒ Any required fee under 37 CFR § 41.20(b)(2) will be made at the time of submission via EFS-Web. In the event fees are not or cannot be paid at the time of EFS-Web submission, please charge any fees under 37 CFR § 1.17 which may be required to Deposit Account No. 13-3723.
- ☒ Please charge any additional fees associated with the prosecution of this application to Deposit Account No. 13-3723. This authorization includes the fee for any necessary extension of time under 37 CFR § 1.136(a). To the extent any such extension should become necessary, it is hereby requested.
- ☒ Please credit any overpayment to the same deposit account.

A Notice of Appeal in this application was filed on January 15, 2010.

**REAL PARTY IN INTEREST**

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

**RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals or interferences.

**STATUS OF CLAIMS**

Claims 27-47 and 49-71 are pending in this patent application. These claims have been rejected and are the subject of this appeal.

**STATUS OF AMENDMENTS**

No amendments have been filed after the final rejection.

**SUMMARY OF CLAIMED SUBJECT MATTER**

A concise explanation of each of the independent claims involved in the appeal, which refers to the specification by page and line number, and to the drawing, if any, by reference is set forth below:

<b>Claim 28</b>	
<b>Limitation</b>	<b>Specification Page and Line Numbering</b>
a respirator	page 2, line 28
unidirectional valve	page 2, line 29
face mask	page 2, line 29
one opening for receiving unidirectional valve	page 2, lines 29-30
valve body	page 2, line 31
valve flap	page 2, line 29; page 3, line 1
first portion of valve flap	page 3, line 1
second portion of valve flap	page 3, line 2
curvature of Valve flap from first end to second end when not attached to valve body	page 6, lines 5-7; Fig. 3
curvature flattened when valve flap seals the opening	page 6, lines 11-14; Fig. 4

<b>Claim 38</b>	
<b>Limitation</b>	<b>Specification Page and Line Numbering</b>
a respirator	page 2, line 28
face mask	page 2, line 29
opening formed therethrough	page 2, lines 29-30
unidirectional valve located over the opening in the face mask	page 2, line 32; page 3, line 1
valve flap attached to the face mask over the opening	page 5, lines 23-31; Figs. 1 and 2
curvature from a first end to a second end when the valve flap is not attached to the face mask	page 6, lines 5-7; Fig. 3
curvature of the valve flap is at least partially flattened when the valve flap seals the opening in the face mask	page 6, lines 11-14; Fig. 4; page 11, lines 5-7

<b>Claim 51</b>	
<b>Limitation</b>	<b>Specification Page and Line Numbering</b>
a respirator	page 2, line 28
a unidirectional valve	page 2, line 29
a face mask	page 2, line 29
unidirectional valve attached to the face mask over an opening formed through the face mask	page 2, line 32; page 3, line 1; page 5, lines 13-14
valve body	page 2, line 31
valve opening	page 5, lines 16-18
cantilevered valve flap	Figs. 3, 4, and 7
first end attached to the valve body	page 2, line 31
a second end located opposite from the first end	page 6, line 5; Figs. 3 and 4
first end of the valve flap is attached to the valve body outside of the valve opening	Figs. 1-3; page 12
a curvature from the first end to the second end when the valve flap is not attached to the valve body	page 6, lines 5-7; Fig. 3
at least a portion of the curvature of the valve flap is at least partially flattened when the valve flap seals the valve opening	page 6, lines 11-14; Fig. 4; page 11, lines 5-7

<b>Claim 61</b>	
<b>Limitation</b>	<b>Support</b>
a respirator	page 2, line 28
a face mask	page 2, line 29
an opening formed therethrough	page 2, line 32
unidirectional valve located over the opening in the face mask	page 2, line 32; page 3, line 1
cantilevered valve flap	page 11, lines 17-19; Figs. 3, 4, and 7
a first end attached to the face mask	page 11, lines 19-20
cantilevered valve flap extends over the opening	page 12, lines 6-7
curvature from the first end to a second end when the cantilevered valve flap is not attached to the face mask	page 6, lines 5-7; Fig. 3
curvature of the cantilevered valve flap is at least partially flattened when the valve flap seals the opening in the face mask	page 6, lines 11-14; Fig. 4; page 11, lines 5-7

### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

#### **First Ground of Rejection**

Claims 27-41 and 49-71 have been rejected under 35 USC § 112, second paragraph. The Examiner contends that the present claim language is not consistent.

#### **Second Ground of Rejection**

Claims 27-34 and 38-44 have been rejected under 35 USC § 102(b) for claiming subject matter that is anticipated by U.S. Patent No. 2,999,498 to Matheson.

#### **Third Ground of Rejection**

Claims 35 and 45 have been rejected for claiming subject matter that would have been obvious to a person of ordinary skill in view of U.S. Patent 2,999,498 to Matheson.

### **ARGUMENT**

#### **First Ground of Rejection**

The present Section 112 rejection has been made because "first the applicant recites that a valve flap having a first portion [is] attached to the valve body, [but] then the applicant recites

that the valve flap is not attached to the body." The Examiner believes that the claim is indefinite since reference is made to the valve flap being attached and not attached to the valve body in the independent claim. Specifically, the claim indicates that the valve flap has a first portion that is attached to the valve body. The claim also states, however, that the flap exhibits a curvature when it is not attached to the valve body and that at least a portion of that curvature is at least partially flattened when the flap seals the valve opening. Thus, in the words of the claim, the valve flap is indeed attached to the valve body, but it exhibits a curvature when it is not attached to the valve body. This particular curvature becomes at least partially flattened when the valve flap seals the valve opening. In other words, the flap has a curvature built into it that becomes at least partially flat when the flap is attached to the valve body and seals the opening. The preexisting curvature and the partial flattening are beneficial in that they create a bias of the valve flap towards the valve opening to cause the flap to seal the valve opening. Applicants accordingly submit that there is no inconsistency in the claim language and that a person of ordinary skill can readily understand it.

As the Board is aware, the purpose of 35 USC § 112 is not to engage in a subjective inquiry as to whether or not claims can be made clearer. The purpose of the statute is to ensure that the claims set forth the metes and bounds of the inventive subject matter such that the claim scope can be readily understood by a person of ordinary skill. Applicants' claim indicates that the valve flap has a first portion that is attached to the valve body. The claim further indicates that the valve flap has a curvature from the first end to the second end *when* the valve flap is not attached to the valve body. The claim merely indicates that the flap would be curved *when* the valve flap is not so attached. And that this "curvature of the valve flap is at least partially flattened when the valve flap seals the valve opening". The flap is therefore curved before being mounted and is at least partially flattened out by the mounting and the contact when sealing the valve opening. Applicants accordingly fail to see any lack of clarity in the claim and believe that the outstanding rejection cannot be properly sustained.

### **Second Ground of Rejection**

Applicants respectfully submit that claims 27-34 and 38-44 are not anticipated by U.S. Patent 2,999,498 to Matheson.

Matheson shows a flap that may be precurved as illustrated in Figure 6. Matheson, however, states that the diaphragm 9 "may be a flat disc but is preferably molded in an arcuate cross-section, as shown, but preferably of greater radius of curvature, such as, for example, 3 ¼ inch radius so that the diaphragm rim portion will be deformed from its normal position to assure constant seating engagement with the break edges 8b, 8c, and 8d."<sup>1</sup> The Matheson flap exhibits a curvature after it is mounted to the valve sheet (see Figure 2), but Matheson does not state that its precurved flap is partially flattened. To the contrary, Matheson illustrates a curved flap in the mounted position (Figure 2). Additionally, Matheson states that the mounted flap preferably has a greater radius of curvature that "will be deformed from its normal position to ensure constant seating engagement." The greater radius of curvature would suggest that the diaphragm becomes increasingly curved when mounted to the valve seat rather than being at least partially flattened. Nowhere does Matheson state that the valve flap becomes partially flattened once mounted to the valve seat. As such, Matheson is teaching away from applicants' invention rather than suggesting it.

### **Third Ground of Rejection**

Claims 35 and 45 have been rejected under 35 USC § 103 for claiming subject matter that would have been obvious over Matheson. Applicants respectfully submit that this rejection also cannot be sustained.

As indicated above, Matheson does not teach or suggest a valve flap that has a curvature to it that becomes at least partially flattened when the valve flap seals the opening. Matheson suggests that the radius is reduced, which would mean that the flap has an increased curvature not a partial flattening.

The Examiner contends that Figure 2 of Matheson describes a valve flap that is at least partially flattened when the valve flap seals the valve opening. The Examiner reproduces Matheson's Figure 2 in the most recent Office Action. In so doing, the Examiner draws an arrow to the center of the valve flap, contending that this area of the valve flap "is partially flattened once mounted to the valve seat 8." Applicants, however, have reviewed this portion of the Matheson disclosure and fail to find any teaching or suggestion of a valve flap that is partially

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<sup>1</sup> Column 3, lines 11-18.

flattened when mounted to the valve seat. Please note that the cord line that extends from a first end of the valve flap to a second end shows that the valve flap is curved between each of the valve ends. This cord line represents the edge of the flap along the flap perimeter. As is readily apparent in Figure 2, the flap center is recessed beneath the valve edge at its greatest depth where the Examiner has drawn the arrowhead. Because of the curvature that is imparted to the flap, the valve flap continues in a downward curvature until it reaches the point where the Examiner has drawn the arrow. At that location, the valve flap curves upwardly towards the opposing edge. Nowhere do applicants see that the valve flap is partially flattened. In order to be partially flattened, the flap needs to be defined in cross-section by a straight line of some significance rather than a continuously curved line. A comparison of the cross-sectional line through the valve flap 9 to the cord line that defines the edge clearly shows that the valve flap is curved from one end to the other.

#### CONCLUSION

For the foregoing reasons, appellants respectfully submit that the outstanding rejections cannot be sustained. Please reverse the decision below.

Respectfully submitted,

March 5, 2010

Date

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**CLAIMS APPENDIX**

27. The respirator of claim 28, wherein the valve flap is removably attached to the valve body.
28. A respirator having a unidirectional valve, comprising:  
a face mask having at least one opening for receiving a unidirectional valve; and  
a unidirectional valve comprising:  
a valve body comprising a valve opening; and  
a valve flap having a first portion attached to the valve body and an adjacent second portion that seals the valve opening, wherein the valve flap has a curvature from a first end to a second end when the valve flap is not attached to the valve body, and further wherein at least a portion of the curvature of the valve flap is at least partially flattened when the valve flap seals the valve opening.
29. The respirator of claim 28, wherein the valve opening is generally planar, and wherein the valve flap curvature biases the valve flap toward the valve opening when the valve flap is attached to the valve body to seal the valve opening.
30. The respirator of claim 28, wherein the valve flap curvature biases the valve flap toward the valve opening to seal the valve opening, and wherein the bias of the valve flap toward the valve opening is sufficient to seal between the valve opening in any orientation of the unidirectional valve.
31. The respirator of claim 28, wherein the curvature in the valve flap comprises a constant curvature from the first end to the second end.
32. The respirator of claim 28, wherein the curvature in the valve flap varies from the first end to the second end.

33. The respirator of claim 28, wherein the face mask is formed of a filtering material.
34. The respirator of claim 28, wherein the unidirectional valve is an exhalation valve.
35. The respirator of claim 28, wherein the unidirectional valve is an inhalation valve.
36. The respirator of claim 28, wherein the valve flap further comprises a top surface, a bottom surface, at least one support element extending from the top surface of the valve flap, and wherein the at least one support element provides the curvature in the valve flap that is at least partially flattened when the valve flap seals the valve opening.
37. The respirator of claim 28, wherein the valve flap further comprises a top surface, a bottom surface, wherein the valve flap further comprises a plurality of support elements extending from the top surface, wherein each of the plurality of support elements is spaced from each adjacent support element, and wherein the plurality of support elements provide the curvature in the valve flap that is at least partially flattened when the valve flap seals the valve opening.
38. A respirator comprising:  
a face mask comprising an opening formed therethrough; and  
a unidirectional valve located over the opening in the face mask, the unidirectional valve comprising a valve flap attached to the face mask over the opening, the valve flap comprising a curvature from a first end to a second end when the valve flap is not attached to the face mask, wherein the curvature of the valve flap is at least partially flattened when the valve flap seals the opening in the face mask.
39. The respirator of claim 38, wherein the at least partially flattened curvature of the valve flap creates a bias that is substantial enough to keep the valve flap sealed over the opening in all orientations.

40. The respirator of claim 38, wherein the curvature of the valve flap comprises a constant curvature.
41. The respirator of claim 38, wherein the curvature of the valve flap varies from the first end to the second end.
42. The respirator of claim 38, wherein the opening is generally planar such that the curvature of the valve flap attached to the face mask over the opening is flattened when the valve flap seals the opening in the face mask.
43. The respirator of claim 38, wherein the face mask is formed of a filtering material.
44. The respirator of claim 38, wherein the unidirectional valve is an exhalation valve.
45. The respirator of claim 38, wherein the unidirectional valve is an inhalation valve.
46. The respirator of claim 38, wherein the valve flap further comprises a top surface, a bottom surface, and at least one support element extending from the top surface of the valve flap, wherein the at least one support element provides the curvature in the valve flap that is at least partially flattened when the valve flap seals the opening.
47. The respirator of claim 38, wherein the valve flap further comprises a top surface, a bottom surface, wherein the valve flap further comprises a plurality of support elements extending from the top surface, wherein each of the plurality of support elements is spaced from each adjacent support element, and wherein the plurality of support elements provide the curvature in the valve flap that is at least partially flattened when the valve flap seals the valve opening.

49. The respirator of claim 28, wherein the valve flap comprises a cantilevered valve flap, and wherein the first portion of the valve flap is attached to the valve body outside of the valve opening.

50. The respirator of claim 38, wherein the valve flap comprises a cantilevered valve flap, and wherein the first end of the cantilevered valve flap is attached to the face mask.

51. A respirator including a unidirectional valve, the respirator comprising:  
a face mask; and

a unidirectional valve attached to the face mask over an opening formed through the face mask, wherein the unidirectional valve comprises:

a valve body comprising a valve opening; and

a cantilevered valve flap comprising a first end attached to the valve body and a second end located opposite from the first end, wherein the first end of the valve flap is attached to the valve body outside of the valve opening, and wherein the valve flap comprises a curvature from the first end to the second end when the valve flap is not attached to the valve body, and further wherein at least a portion of the curvature of the valve flap is at least partially flattened when the valve flap seals the valve opening.

52. The respirator of claim 51, wherein the valve opening is generally planar, and wherein the valve flap curvature biases the valve flap toward the valve opening when the valve flap is attached to the valve body to seal the valve opening.

53. The respirator of claim 51, wherein the valve flap curvature biases the valve flap toward the valve opening to seal the valve opening, and wherein the bias of the valve flap toward the valve opening is sufficient to seal between the valve opening in any orientation of the unidirectional valve.

54. The respirator of claim 51, wherein the curvature in the valve flap comprises a constant curvature from the first end to the second end.
55. The respirator of claim 51, wherein the curvature in the valve flap varies from the first end to the second end.
56. The respirator of claim 51, wherein the face mask is formed of a filtering material.
57. The respirator of claim 51, wherein the unidirectional valve is an exhalation valve.
58. The respirator of claim 51, wherein the unidirectional valve is an inhalation valve.
59. The respirator of claim 51, wherein the valve flap further comprises a top surface, a bottom surface, at least one support element extending from the top surface of the valve flap, and wherein the at least one support element provides the curvature in the valve flap that is at least partially flattened when the valve flap seals the valve opening.
60. The respirator of claim 51, wherein the valve flap further comprises a top surface, a bottom surface, wherein the valve flap further comprises a plurality of support elements extending from the top surface, wherein each of the plurality of support elements is spaced from each adjacent support element, and wherein the plurality of support elements provide the curvature in the valve flap that is at least partially flattened when the valve flap seals the valve opening.
61. A respirator comprising:  
a face mask comprising an opening formed therethrough; and  
a unidirectional valve located over the opening in the face mask, the unidirectional valve comprising a cantilevered valve flap comprising a first end attached to the face mask, wherein the cantilevered valve flap extends over the opening, the cantilevered valve flap comprising a curvature from the first end to a second end when the cantilevered valve flap is not attached to

the face mask, wherein the curvature of the cantilevered valve flap is at least partially flattened when the valve flap seals the opening in the face mask.

62. The respirator of claim 61, wherein the at least partially flattened curvature of the cantilevered valve flap creates a bias that is substantial enough to keep the cantilevered valve flap sealed over the opening in all orientations.

63. The respirator of claim 61, wherein the curvature of the cantilevered valve flap comprises a constant curvature.

64. The respirator of claim 61, wherein the curvature of the cantilevered valve flap varies from the first end to the second end.

65. The respirator of claim 61, wherein the opening is generally planar such that the curvature of the cantilevered valve flap attached to the face mask over the opening is flattened when the cantilevered valve flap seals the opening in the face mask.

66. The respirator of claim 61, wherein the face mask is formed of a filtering material.

67. The respirator of claim 61, wherein the unidirectional valve is an exhalation valve.

68. The respirator of claim 61, wherein the unidirectional valve is an inhalation valve.

69. The respirator of claim 61, wherein the cantilevered valve flap further comprises a top surface, a bottom surface, and at least one support element extending from the top surface of the cantilevered valve flap, wherein the at least one support element provides the curvature in the cantilevered valve flap that is at least partially flattened when the cantilevered valve flap seals the opening.

71. The respirator of claim 61, wherein the cantilevered valve flap further comprises a top surface, a bottom surface, wherein the cantilevered valve flap further comprises a plurality of support elements extending from the top surface, wherein each of the plurality of support elements is spaced from each adjacent support element, and wherein the plurality of support elements provide the curvature in the cantilevered valve flap that is at least partially flattened when the cantilevered valve flap seals the valve opening.

**EVIDENCE APPENDIX**

None.

**RELATED PROCEEDINGS APPENDIX**

None.